

WE CLAIM:

1. In a connection device for positioning a gradient coil assembly in a basic field magnet assembly of a nuclear magnetic resonance tomograph, the gradient coil assembly having a primary cylindrical external surface and the basic field magnet assembly having a primary cylindrical opening for receiving the gradient coil assembly, said cylindrical external surface of the gradient coil assembly being located in a fixed state inside the internal cylindrical surface of the basic field magnet assembly with a tube-shaped intervening space therebetween, the improvements comprising the connection device being primarily a closed annular clamp element with a conical internal surface engaging a portion of an external surface of the gradient coil assembly as the clamp element is centered between the gradient coil assembly and the basic field magnet assembly.

2. In a connection device according to claim 1, wherein the clamp element includes at least one element selected from bores and gaps.

3. In a connection device according to claim 1, wherein the gradient coil assembly includes a conical external surface on the end engaging a conical internal surface of the clamp element and being congruent with the conical inner surface of the clamp element to form a form-fitting first contact surface.

4. In a connection device according to claim 3, wherein the first contact surface is an axis-symmetrical surface.

5. In a connection device according to claim 4, wherein the first contact surface and the axis of symmetry describe an angle of between 5 and 15 degrees.

6. In a connection device according to claim 5, wherein the gradient coil assembly and the basic field magnet assembly are directly, form-fittingly connected by a conical second contact surface on a surface of the gradient coil assembly opposite the end engaged by the clamp element.

7. In a connection device according to claim 6, wherein the second contact surface is axis-symmetrical.

8. In a connection device according to claim 7, wherein the second contact surface and the axis of symmetry describe an angle of between 5 and 15 degrees.

9. In a connection device according to claim 1, wherein the clamp element is held clamped by use of at least one element selected from bolts, studs and combinations of bolts and studs between the gradient coil assembly and the basic field magnet assembly.

10. In a connection device according to claim 1, wherein the clamp element is made of an electrical non-conductive material.

11. In a connection device according to claim 1, wherein the gradient coil assembly and the basic field magnet assembly are form-fittingly connected by a conical second contact surface at a surface of the gradient coil assembly opposite the clamp element.

12. In a connection device according to claim 11, wherein the second contact surface is axial-symmetrical.

13. In a connection device according to claim 12, wherein the second contact surface in the axis of symmetry describes an angle of between 5 and 15 degrees.

14. In a nuclear magnetic resonance tomograph having a cylindrical gradient coil assembly having an inside diameter to enable insertion of a tray with a patient thereon, said gradient coil assembly being telescopically received in a cylindrical basic field magnet assembly and positioned with an annular spacing between an outer cylindrical surface of the gradient coil assembly and an inner cylindrical surface of the basic field magnet assembly, a connecting device including an annular clamp element with a conical internal surface, said conical internal surface engaging a conical external surface at an end of the gradient coil assembly as the clamp element is inserted between the gradient coil assembly and the basic field magnet assembly.

15. A method for connecting a gradient coil assembly within a basic field magnet assembly having a cylindrical interior surface, said method comprising positioning the gradient coil assembly in the basic field magnet assembly, inserting a tapered end of an annular clamp element between an end of the gradient coil assembly and the interior surface of the basic field magnet assembly and forcing the clamp element into tight engagement with the end of the gradient coil assembly to hold the gradient coil assembly in a spaced relationship within the basic field magnet assembly with an annular gap between an exterior surface of the gradient coil assembly and the interior surface of the basic field magnet assembly.